REMARKS

Applicants wish to thank Examiner Dote for acknowledging their claim to priority and for indicating that the (non-abandoned) references cited in the Information Disclosure Statements have been considered.

The objections to the disclosure at Official Action paragraph 3 have been obviated by amendment. Applicants have corrected the typographical error referring to Figure 5, and the trademarks have been capitalized wherever they appear in the specification. Applicants note that the generic terminology referring to the trademarks is already present in the specification. Withdrawal of the objections is kindly solicited.

The rejections in Official Action paragraphs 6-11, 14-17 and 20-21 have been obviated by amendment. The broad claims at issue have been amended to recite the limitations of claims which were not included in these rejections. Withdrawal of these rejections is kindly solicited.

The sole issues remaining in this application are the rejections referred to in Official Action paragraphs 12, 13 and 19, and they are discussed below.

The rejection of Claims 1-5, 8-15, 18, 19, 29-33, 36 and 37 under 35 U.S.C. §103(a) over JP '711 combined with JP '250 is obviated-in-part by amendment and is respectfully traversed-in-part. The references do not teach at least the combination of the asymmetric bisazo pigment and organic sulfur compounds as particularly claimed, and the references do not suggest the significant improvements in the reduction of black spots and undesired images obtained by the present invention.

As recognized by the Office, JP '711 does not teach the present invention because it lacks the particular organic sulfur compound required by the claims. As noted in the

specification page 3, last paragraph, JP '711 is concerned with charge properties and offers as a solution a combination of an azo compound and a phthalocyanine compound. The reference discloses both asymmetric and symmetric bisazo compounds. The reference mentions in passing that antioxidants may be used, but no particular antioxidant is mentioned and thus one must conclude from the reference that all antioxidants would behave similarly. There is no suggestion in JP '711 that the formation of black spots could be reduced or prevented or that undesirable images due to background fouling could be reduced or prevented.

The Office relies on JP '250 to provide the organic sulfur compound. Applicants respectfully submit that this reliance is misplaced because the JP '250 reference teaches that an organic sulfur compound is useful only in the context of *symmetric* azo pigments because only symmetric azo pigments are disclosed in JP '250. Even if one were motivated to combine JP '250's organic sulfur compounds with JP '711's *symmetric* azo pigments, one would still not have the expectation of success necessary to sustain an obviousness rejection over the present invention which necessarily requires a combination of an asymmetric bisazo compound and an organic sulfur compound. Accordingly, it is believed that *prima facie* obviousness is lacking in the combination of JP '711 and JP '250.

If the Office deems that *prima facie* obviousness nevertheless exists in the combination of JP '250 and JP '711, it is believed to be rebutted by the evidence already of record in the specification. Like JP '711, JP '250 does not suggest that image qualities can be improved by the addition of an organic sulfur compound. As noted on page 4, first full paragraph of the specification, JP '250 describes that by adding the organic sulfur-containing compound, the increase of the photoreceptor residual potential and the photoreceptor deterioration due to light irradiation can be controlled. For convenience, Applicants have

reproduced several tables (see the attached Appendix) that show the remarkable image improvements obtained by the present invention when compared to compositions that are closer than the closest prior art. The make up of the various invention and comparison examples is shown at pages 36-46 of the specification.

The rejection of Claims 20-24, 27 and 28 under 35 U.S.C. §103(a) over JP '711 combined with JP '250 and further combined with Kanoto is obviated-in-part by amendment and is respectfully traversed-in-part.

The addition of Kanoto does not cure the deficiencies of JP '711 and JP '250 discussed above. Kanoto merely adds a process cartridge. For this and the reasons given above and in view of the claim amendments withdrawal of this ground of rejection is kindly solicited.

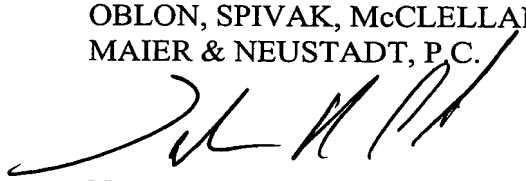
The rejection of Claims 1-5, 8-10, 12-15, 18, 19, 29-33, 36 and 37 for obviousness-type double patenting over Claims 1-9 of Suzuki in view of JP '250 is obviated-in-part by amendment and is respectfully traversed-in-part.

Suzuki does not disclose or suggest that an antioxidant should be used. In addition, as noted above, JP '250 makes no mention of asymmetric azo compounds and instead teaches that the organic sulfur compounds are useful only with symmetric azo compounds; Suzuki is concerned with asymmetric disazo compounds. Accordingly, there is no motivation to combine the teachings of JP '250 with Suzuki and likewise no expectation of success. Even *prima facie* obviousness would be rebutted, however, in view of the evidence already of record which establishes the superiority of the claimed invention. For these reasons, the obviousness type double patenting rejection is believed to be unsustainable, and its withdrawal is kindly solicited.

Applicants respectfully submit that this application is now in condition for allowance, and early notice of such action is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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APPENDIX

Table 12

	⊿VD (V)	Black Spots	Undesired Images
Example 1	170	Black sport were observed from 30,000th image	None
Example 2	140	Black spot were observed from 35,000th image	None
Comparative Example 1	280	Black spots were observed from 20,000th image	Background fouling
Comparative Example 2	260	Black spots were observed from 23,000th image	Background fouling

Table 13

	⊿VD (V)	Black spots	Undesired images
Example 3	100	Black spots were observed from 41,000th image	None
Example 4	80	Black spots were observed from 45,000th image	None
Comparative Example 3	180	Black spots were observed from 27,000th image	Background fouling
Comparative Example 4	180	Black spots were observed from 30,000th image	Background fouling

Table 16

	⊿VD (V)	Black spots	Undesired images
Example 5	50	Not observed	None
Example 6	50	Not observed	None
Example 7	20	Not observed	None
Example 8	20	Not observed	None
Example 9	55	Not observed	None
Example 10	60	Not observed	None
Example 11	20	Not observed	None
Example 12	25	Not observed	None
Example 13	50	Not observed	None
Example 14	50	Not observed	None
Example 15	20	Not observed	None
Example 16	20	Not observed	None
Comparative Example 5	100	Black spots were observed from 38,000th image	Background fouling
Comparative Example 6	90	Black spots were observed from 40,000th image	None
Comparative Example 7	95	Black spots were observed from 39,000th image	None
Comparative Example 8	100	Black spots were observed from 37,000th image	None
Comparative Example 9	105	Black spots were observed from 35,000th image	Background fouling
Comparative Example 10	95	Black spots were observed from 39,000th image	None
Comparative Example 11	95	Black spots were observed from 38,000th image	None
Comparative Example 12	100	Black spots were observed from 36,000th image	None
Comparative Example 13	105	Black spots were observed from 38,000th image	Background fouling

	⊿VD (V)	Black spots	Undesired images
Comparative Example 14	95	Black spots were observed from 40,000th image	None
Comparative Example 15	95	Black spots were observed from 40,000th image	None
Comparative Example 16	105	Black spots were observed from 38,000th image	None

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AMENDMENT AND REQUEST FOR RECONSIDERATION

IN THE SPECIFICATION

Please amend the specification as follows:

Please amend the paragraph bridging pages 34 and 35 as follows:

--[Fig. 4] Fig. 5 is a schematic view illustrating a main part of an embodiment of the image forming apparatus of the present invention. Around the peripheral surface of a photoreceptor 31 of the present invention, a light irradiating device 32 for removing the residual potential of the photoreceptor 31, a charger 33 for charging the photoreceptor 31, an imagewise light irradiating device 35 for irradiating the photoreceptor 31 with imagewise light to form an electrostatic latent image thereon, a developing unit 36 for developing the latent image with a developer including a toner to form a toner image on the photoreceptor 31, a transfer/separation unit 40 for transferring the toner image onto a receiving material, and a cleaning unit 44 for cleaning the photoreceptor 31, are provided in this order.--

Please amend the paragraph at page 36, lines 4-18, as follows:

--The following components were mixed and dispersed for 72 hours using a ball mill to prepare an intermediate layer coating liquid.

Titanium dioxide 70

(Tradenamed as CR-EL and manufactured by Ishihara Sangyo Kaisha Ltd., a Japanese Company)

Alkyd resin 15

(Tradenamed as [Bekkolite] BEKKOLITE M6401-50-S and manufactured by Dainippon Ink and Chemicals, Inc., a Japanese Company, solid content of 50% by weight)

Melamine resin 10

(Tradenamed as [Super Bekkamin] SUPER BEKKAMIN L-121-60 and manufactured by Dainippon Ink and Chemicals, Inc., solid content of 60% by weight)

Methyl ethyl ketone 100--

IN THE CLAIMS

Please cancel Claims 2, 8, 9, 12, 18, 19, 21, 27, 28, 30, 36 and 37.

Please amend the claims as follows:

--1. (Amended) An electrophotographic photoreceptor, comprising:

an electroconductive substrate, and

a photosensitive layer on the electroconductive substrate,

wherein the photosensitive layer comprises:

a charge generation layer, and

a charge transport layer,

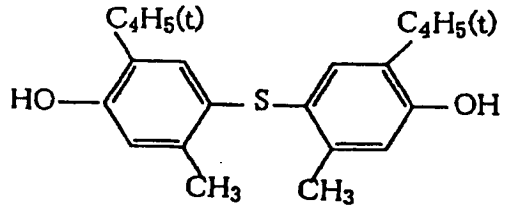
wherein the charge generation layer comprises, as [at least two] charge generation materials which have spectral sensitivity in differing wavelength regions, at least one phthalocyanine pigment and at least one asymmetric bisazo pigment having the following formula (I):

$$Cp_1\text{-}N{=}N\text{-}A\text{-}N{=}N\text{-}Cp_2 \qquad (I)$$

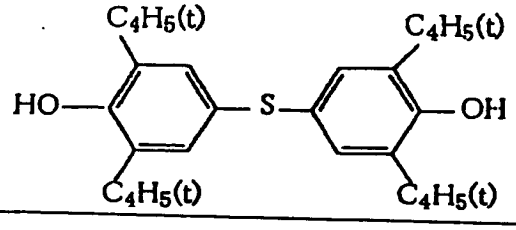
wherein A represents a divalent group having a carbon atom which connects the nitrogen atoms of the adjacent azo groups; and Cp_1 and Cp_2 each, independently, represent a residual group of a coupler, wherein Cp_1 is different from Cp_2;

and wherein the [photosensitive layer further comprises an] charge transport layer comprises an organic sulfur-containing compound selected from the group consisting of compounds having the following formulas III, S-1, S-2 and S-3:

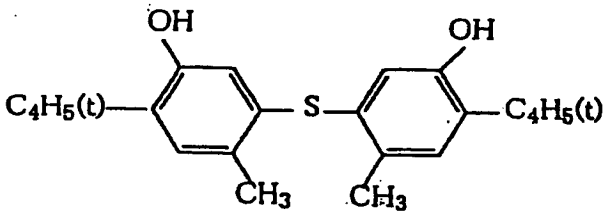
$$S\text{-}(CH_2CH_2COOC_nH_{2n+1})_2 \qquad \text{(III)}$$



(S-1)



(S-2)



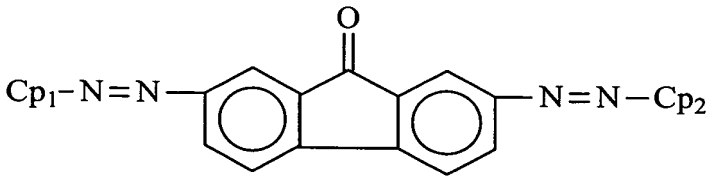
(S-3)

wherein n is an integer of from 8 to 25.

2. Canceled.

3. (Amended) The electrophotographic photoreceptor according to [Claim 2] Claim 1, wherein the phthalocyanine pigment and the asymmetric bisazo pigment are present in the photosensitive layer in a ratio of 1:5 to 5:1 by weight.

4. (Amended) The electrophotographic photoreceptor according to [Claim 2] Claim 1, wherein the asymmetric bisazo pigment comprises a compound having the following formula (II):



(II)

wherein Cp_1 and Cp_2 each, independently, represent a residual group of a coupler, wherein Cp_1 is different from Cp_2.

5. (Amended) The electrophotographic photoreceptor according to [Claim 2] Claim 1, wherein the phthalocyanine pigment comprises at least one of a τ-form metal-free phthalocyanine pigment or an X-form metal-free phthalocyanine pigment.

6. The electrophotographic photoreceptor according to Claim 5, wherein the phthalocyanine pigment comprises a τ-form metal-free phthalocyanine pigment having an X-ray diffraction spectrum in which main peaks are observed at Bragg 2θ angle of 7.6°, 9.2°, 16.8°, 17.4°, 20.4°, 20.9°, 21.7° and 27.6° when a specific X-ray of Cu-Kα having a wavelength of 1.541 Å irradiates the pigment.

7. The electrophotographic photoreceptor according to Claim 5, wherein the phthalocyanine pigment comprises an X-form metal-free phthalocyanine pigment having an X-ray diffraction spectrum in which main peaks are observed at Bragg 2θ angle of 7.5°, 9.1°,

16.7°, 17.3°, 22.3° and 28.8° when a specific X-ray of Cu-Kα having a wavelength of 1.541 Å irradiates the pigment.

8. Canceled.

9. Canceled.

10. (Amended) An electrophotographic image forming apparatus comprising:

an electrophotographic photoreceptor;

a charging device which charges the photoreceptor;

a light irradiation device which irradiates the charged photoreceptor to form an electrostatic latent image on the photoreceptor;

a developing device which reversely develops the electrostatic latent image with a developer including a toner, to form a toner image on the photoreceptor;

an image transfer device which transfers the toner image to a receiving material; and

a cleaning device which cleans the photoreceptor,

wherein the electrophotographic photoreceptor comprises:

an electroconductive substrate, and

a photosensitive layer on the electroconductive substrate,

and wherein the photosensitive layer comprises:

a charge generation layer, and

a charge transport layer,

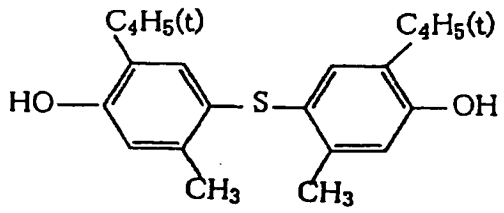
wherein the charge generation layer comprises, as [at least two] charge generation materials which have spectral sensitivity in differing wavelength regions, at least one phthalocyanine pigment and at least one asymmetric bisazo pigment having the following formula (I):

$$Cp_1\text{-}N{=}N\text{-}A\text{-}N{=}N\text{-}Cp_2 \qquad (I)$$

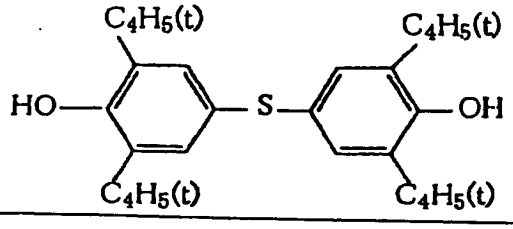
wherein A represents a divalent group having a carbon atom which connects the nitrogen atoms of the adjacent azo groups; and Cp_1 and Cp_2 each, independently, represent a residual group of a coupler, wherein Cp_1 is different from Cp_2;

and wherein the [photosensitive layer further comprises an] charge transport layer comprises an organic sulfur-containing compound selected from the group consisting of compounds having the following formulas III, S-1, S-2 and S-3:

$$S\text{-}(CH_2CH_2COOC_nH_{2n+1})_2 \qquad \text{(III)}$$



(S-1)



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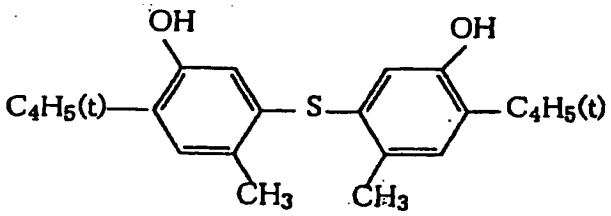


(S-3)

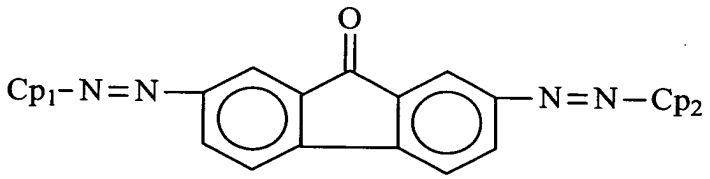
wherein n is an integer of from 8 to 25.

11. The electrophotographic image forming apparatus according to Claim 10 , wherein the charging device charges the photoreceptor while contacting the photoreceptor.

12. Canceled.

13. (Amended) The electrophotographic image forming apparatus according to [Claim 12] Claim 10, wherein the phthalocyanine pigment and the asymmetric bisazo pigment are present in the photosensitive layer in a ratio of 1:5 to 5:1 by weight.

14. (Amended) The electrophotographic image forming apparatus according to [Claim 12] Claim 10, wherein the asymmetric bisazo pigment comprises a compound having the following formula (II):



(II)

wherein Cp_1 and Cp_2 each, independently, represent a residual group of a coupler, wherein Cp_1 is different from Cp_2.

15. (Amended) The electrophotographic image forming apparatus according to [Claim 12] Claim 10, wherein the phthalocyanine pigment comprises at least one of a τ-form metal-free phthalocyanine pigment or an X-form metal-free phthalocyanine pigment.

16. The electrophotographic image forming apparatus according to Claim 15, wherein the phthalocyanine pigment comprises a τ-form metal-free phthalocyanine pigment having an X-ray diffraction spectrum in which main peaks are observed at Bragg 2θ angle of 7.6°, 9.2°, 16.8°, 17.4°, 20.4°, 20.9°, 21.7° and 27.6° when a specific X-ray of Cu-Kα having a wavelength of 1.541 Å irradiates the pigment.

17. The electrophotographic image forming apparatus according to Claim 15, wherein the phthalocyanine pigment comprises an X-form metal-free phthalocyanine pigment having an X-ray diffraction spectrum in which main peaks are observed at Bragg 2θ angle of 7.5°, 9.1°, 16.7°, 17.3°, 22.3° and 28.8° when a specific X-ray of Cu-Kα having a wavelength of 1.541 Å irradiates the pigment.

18. Canceled.

19. Canceled.

20. (Amended) An electrophotographic process cartridge comprising:

a photoreceptor: and

at least one device selected from the groups consisting of:

a charging device which charges the photoreceptor;

a light irradiation device which irradiates the charged photoreceptor to form an electrostatic latent image on the photoreceptor;

a developing device which reversely develops the electrostatic latent image with a developer including a toner to form a toner image on the photoreceptor;

an image transfer device which transfers the toner image to a receiving material; and

a cleaning device which cleans the photoreceptor,

wherein the photoreceptor comprises:

an electroconductive substrate, and

a photosensitive layer on the electroconductive substrate,

and wherein the photosensitive layer comprises:

a charge generation layer, and

a charge transport layer,

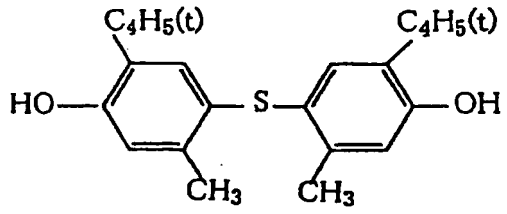
wherein the charge generation layer comprises, as [at least two] charge generation materials which have spectral sensitivity in differing wavelength regions, at least one phthalocyanine pigment and at least one asymmetric bisazo pigment having the following formula (I):

$$Cp_1\text{-}N{=}N\text{-}A\text{-}N{=}N\text{-}Cp_2 \qquad (I)$$

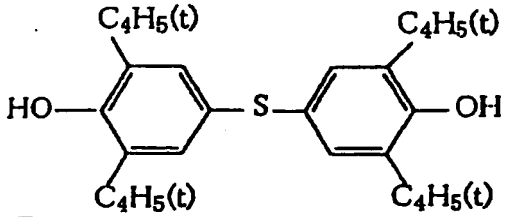
wherein A represents a divalent group having a carbon atom which connects the nitrogen atoms of the adjacent azo groups; and Cp_1 and Cp_2 each, independently, represent a residual group of a coupler, wherein Cp_1 is different from Cp_2;

and wherein the [photosensitive layer further comprises an] charge transport layer comprises an organic sulfur-containing compound selected from the group consisting of compounds having the following formulas III, S-1, S-2 and S-3:

$$S\text{-}(CH_2CH_2COOC_nH_{2n+1})_2 \qquad (III)$$



(S-1)



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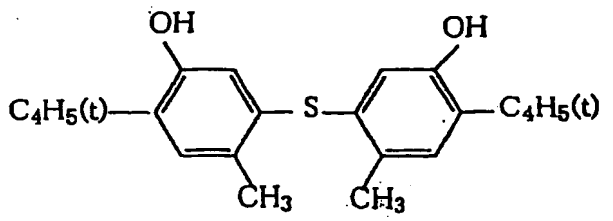


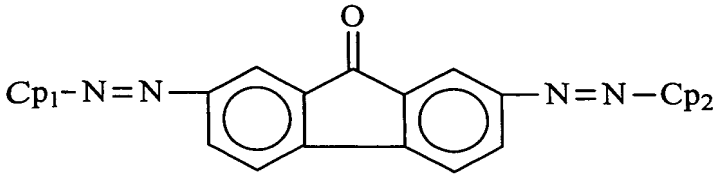
(S-3)

wherein n is an integer of from 8 to 25.

21. Canceled.

22. (Amended) The electrophotographic process cartridge according to [Claim 21] Claim 20, wherein the phthalocyanine pigment and the asymmetric bisazo pigment are present in the photosensitive layer in a ratio of 1:5 to 5:1 by weight.

23. (Amended) The electrophotographic process cartridge according to [Claim 21] Claim 20, wherein the asymmetric bisazo pigment comprises a compound having the following formula (II):



(II)

wherein Cp_1 and Cp_2 each, independently, represent a residual group of a coupler, wherein Cp_1 is different from Cp_2.

24. (Amended) The electrophotographic process cartridge according to [Claim 21] Claim 20, wherein the phthalocyanine pigment comprises at least one of a τ-form metal-free phthalocyanine pigment or an X-form metal-free phthalocyanine pigment.

25. The electrophotographic process cartridge according to Claim 24, wherein the phthalocyanine pigment comprises a τ-form metal-free phthalocyanine pigment having an X-

ray diffraction spectrum in which main peaks are observed at Bragg 2θ angle of 7.6°, 9.2°, 16.8°, 17.4°, 20.4°, 20.9°, 21.7° and 27.6° when a specific X-ray of Cu-Kα having a wavelength of 1.541 Å irradiates the pigment.

26. The electrophotographic process cartridge according to Claim 24, wherein the phthalocyanine pigment comprises an X-form metal-free phthalocyanine pigment having an X-ray diffraction spectrum in which main peaks are observed at Bragg 2θ angle of 7.5°, 9.1°, 16.7°, 17.3°, 22.3° and 28.8° when a specific X-ray of Cu-Kα having a wavelength of 1.541 Å irradiates the pigment.

27. Canceled.

28. Canceled.

29. (Amended) An electrophotographic image forming method comprising the steps of:

providing an electrophotographic photoreceptor;

charging the electrophotographic photoreceptor;

irradiating the electrophotographic photoreceptor with light to form an electrostatic latent image on the electrophotographic photoreceptor;

reversely developing the electrostatic latent image with a developer including a toner to form a toner image on the electrophotographic photoreceptor;

transferring the toner image to a receiving material; and

cleaning the electrophotographic photoreceptor,

wherein the electrophotographic photoreceptor comprises:

an electroconductive substrate, and

a photosensitive layer on the electroconductive substrate,

and wherein the photosensitive layer comprises:

a charge generation layer, and

a charge transport layer,

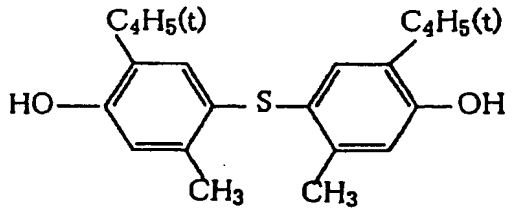
wherein the charge generation layer comprises, as [at least two] charge generation materials which have spectral sensitivity in differing wavelength regions, at least one phthalocyanine pigment and at least one asymmetric bisazo pigment having the following formula (I):

$$Cp_1\text{-}N{=}N\text{-}A\text{-}N{=}N\text{-}Cp_2 \qquad (I)$$

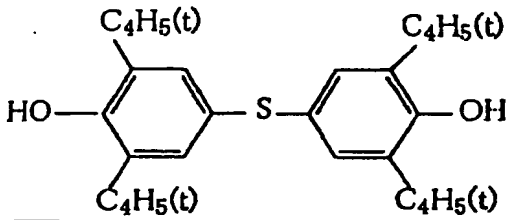
wherein A represents a divalent group having a carbon atom which connects the nitrogen atoms of the adjacent azo groups; and Cp_1 and Cp_2 each, independently, represent a residual group of a coupler, wherein Cp_1 is different from Cp_2;

and wherein the [photosensitive layer further comprises an] charge transport layer comprises an organic sulfur-containing compound selected from the group consisting of compounds having the following formulas III, S-1, S-2 and S-3:

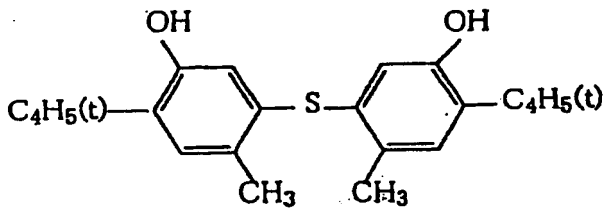
$$S\text{-}(CH_2CH_2COOC_nH_{2n+1})_2 \qquad (III)$$



(S-1)



(S-2)



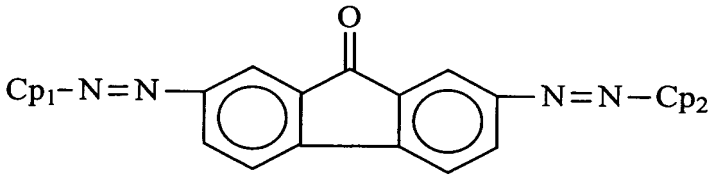
(S-3)

wherein n is an integer of from 8 to 25.

30. Canceled.

31. (Amended) The electrophotographic image forming method according to [Claim 30] Claim 29, wherein the phthalocyanine pigment and the asymmetric bisazo pigment are present in the photosensitive layer in a ratio of 1:5 to 5:1 by weight.

32. (Amended) The electrophotographic image forming method according to [Claim 30] Claim 29, wherein the asymmetric bisazo pigment comprises a compound having the following formula (II):



(II)

wherein Cp_1 and Cp_2 each, independently, represent a residual group of a coupler, wherein Cp_1 is different from Cp_2.

33. (Amended) The electrophotographic image forming method according to [Claim 30] Claim 29, wherein the phthalocyanine pigment comprises at least one of a τ-form metal-free phthalocyanine pigment or an X-form metal-free phthalocyanine pigment.

34. The electrophotographic image forming method according to Claim 33, wherein the phthalocyanine pigment comprises a τ-form metal-free phthalocyanine pigment having an X-ray diffraction spectrum in which main peaks are observed at Bragg 2θ angle of 7.6°, 9.2°, 16.8°, 17.4°, 20.4°, 20.9°, 21.7° and 27.6° when a specific X-ray of Cu-Kα having a wavelength of 1.541 Å irradiates the pigment.

35. The electrophotographic image forming method according to Claim 33, wherein the phthalocyanine pigment comprises an τ-form metal-free phthalocyanine pigment having an X-ray diffraction spectrum in which main peaks are observed at Bragg 2θ angle of 7.5°, 9.1°, 16.7°, 17.3°, 22.3° and 28.8° when a specific X-ray of Cu-Kα having a wavelength of 1.541 Å irradiates the pigment.--

36. Canceled.

37. Canceled.